

| BA | SIS OF DESIGN  |       |          |           |        |       |
|----|--|-------|----------|-----------|--------|-------|
| 1. | BUILDING CODE  |       | 2006     | TBC       |        |       |
| 2. | OCCUPANCY CATEGORY   |       | II       | 120       |        |       |
|    | Concrete DecksLIVE LOADS                                     |       | 88       | psf       |        |       |
|    | Floors   |       | 50       | psf       |        |       |
|    | Snow load on ground, Po                                      | g     | 42.8     | psf       |        |       |
|    | Snow load on flat roof, P                                    | Ē     | 30       | psf       |        |       |
|    | Exposure factor: Co  | e     |          | _         |        |       |
|    | Importance factor:   | s     | 1.0      |           |        |       |
|    | Thermal factor: C  | t     | 1.0      |           |        |       |
| 4. | WIND DESIGN:   |       |          |           |        |       |
|    | Basic wind speed   |       | 90       | mph       |        |       |
|    | Importance factor:   |       |          | -         |        |       |
| 5. | Exposure   |       | С        |           |        |       |
|    | Importance factor:   | e     | 1.0      |           |        |       |
|    | Mapped Spectral response accelerate                          | ions: |          |           |        |       |
|    | Ss & S1  |       | 1.70     | & 0.69    |        |       |
|    | Site class   |       | D        |           |        |       |
|    | SDs & SD1  |       | 1.00     | & 0.69    |        |       |
|    | Seismic Design Category Basic Seismic-Force-Resisting System |       | D        |           |        |       |
|    | Bearing wall systems, Spec                                   |       | nfored ( | чта домог | Chaar  | Walle |
|    | Design Base Shear  |       |          |           | biicai | Walls |
|    | Seismic response coefficient: C                              |       |          | итрь      |        |       |
|    | Response modification factor: R                              |       |          |           |        |       |
|    | Analysis procedure: EQUIVALENT                               |       |          |           |        |       |

- 6. SOILS: . ABBREVIATIONS:
- ARCH = Architect EOR = Engineer of record. See professional stamp this page.
- UNO = Unless noted otherwise (E) = Existing condition(N) = New construction

#### GENERAL EVALUATION AND REPAIR PROCEEDURE for UNBONDED POST-TENSIONED CONCRETE STRUCTURE

1. METHOD OF EVALUATION:

- A. Existing structural drawings exist for this structure. The repair design has been developed from those drawings and field investigation. B. Additional evaluation will be required during the repair process. C. ICRI Technical Guideline No. 03736 "Guide for the Evaluation of Unbonded Post-Tensioned Concrete Structures" was used as a guide.
- 2. METHOD OF REPAIR:
- A. ICRI Technical Guideline No. 03743 "Guide for the Repair of Unbonded Post-Tensioned Concrete Structures" will be used for the bases of repair. B. Details, sections and notes on these plans are intended to be used as a starting point for this project. The scope of details and instructions will be expanded if the need arises. C. See section "BASIC REPAIR SEQENCE" on this sheet for additional information.
- A. Post-tensioning repair requires specialized knowledge
- B. Contractor and field personal in charge of repair shall be PTI "Certified"
- C. Safty will be the order of the day. D. Comply with all OSHA requirements.

#### GENERAL INSTRUCTIONS TO THE CONTRACTOR & SUBCONTRACTORS

- 1. THE GENERAL CONTRACTOR SHALL: A. become familiar with all portions of the contract documents. No deviations will be allowed unless agreed upon by all parties.
- B. verify all dimensions. C. field verify site conditions and immediately notify the EOR regarding conditions which are not as shown on the drawings. D. be responsible for safety and protection in and around the job site
- and/or adjacent properties. E. report progress of work to owner & EOR. coordinate all required inspections, testing, and/or observations as work proceeds. Notify the EOR at least 48 hours prior to cover-up for any required observations.
- 2. CONTRACT DOCUMENTS Details, sections and notes shown on the structural drawings are
- intended to be typical and shall apply to all similar situations encountered during the repairs, UNO. B. The contract documents take precedence over shop drawings unless specifically noted otherwise.
- 3. BUILDING CODE COMPLIANCE: Inspection, testing, construction, workmanship and materials shall conform to the requirements of the governing building code and standards. Amend ASTM and IBC designations to latest edition.
- 4. THE GENERAL CONTRACTOR SHALL COORDINATE:
- A. all work between the various trades and subcontractors. B. any construction situation not covered by these plans or general
- C. with the EOR existing conditions that are not as shown on these drawings. Details, as shown on the drawings, maybe different and may require alternate solutions. Existing condition information on the drawings is based on best knowledge acquired during the design phase and may differ from actual conditions. EOR will provide new details or direction as required.
- 5. CONSTRUCTION SEQUENCE, SHORING, AND BRACING REQUIREMENTS A. The general contractor is responsible for the method, means, and sequence of all structural erection except when specifically noted otherwise on the drawings. He shall provide temporary shoring as his method of repair requires to provide adequate vertical support during repair. Shoring shall remain in place until concrete reaches adequate structural strength and post-tensioning has been tensioned.
- 6. OMISSIONS AND/OR CONFLICTS
- A. Omissions in and/or conflicts between the various elements of the contract documents shall be brought to the immediate attention of the EOR and shall be resolved by the same. Should the contractor wish to proceed without consulting with the EOR, he does so at his own financial risk. B. In case of conflict in the structural work, the most stringent requirements, as directed by the EOR, shall be implemented at no additional cost to the owner.
- C. Additional openings required thorough structural members not specifically shown on the structural drawings shall be reported to the EOR for review prior to installation.
- 7. MISCELLANEOUS: A. During and after construction, the contractor and/owner shall keep the loads on the structure within the limits of the design. B. Observation visits to the site by the EOR shall not be construed as inspection nor approval of construction unless stated as such.
- A. The following items shall be submitted to the EOR for review prior to fabrication, erection, installation, or otherwise being incorporated
- into the project Materials certification for all concrete materials. Mix designs for each type of concrete or grout.
- B. A minimum of one weeks shall be allowed for the review of all submittals by the EOR. C. Requests for substitutions shall be submitted to the EOR in writing. Substitutions are not allowed unless approved in writing by the EOR.

#### SPECIAL INSPECTION AND TESTING

- .. INSPECTIONS: Provide special inspection by an independent agency per IBC Chapter 17 for new construction as follows: Concrete: inspector shall be ACI-II or ICBO certified.
- Existing & new Reinforcing steel Existing & new Post tensioning, sheathing, & anchors. For Structural repair: Keep a record of repair materials and
- tensioning forces for the EOR's review. 2. TESTING: The owner shall provide testing by qualified testing agencies for the following types of construction as directed by the EOR. Concrete: strength. Existing reinforcement. Determine % of deterioration.
- 3. THE CONTRACTOR SHALL: A. correct work found to be deficient by either the testing agency or

Existing post tensioning. Determine % of deterioration.

B. not proceed with subsequent work until the required inspections and testing has been finished or as directed by the EOR.

## CONCRETE

- 1. CODES AND STANDARDS. Comply with the following Codes: A. ACI 301, "Specifications for Structural Concrete for Buildings" B. ACI 318, "Building Code Requirements for Reinforced Concrete". C. ACI 347, "Recommended Practice for Concrete Form Work".
- 2. MATERIALS shall conform to the following: A. Cement; ASTM C150, Type I, Portland Cement.
- B. Hard rock aggregates: ASTM C33 C. Water shall be potable.
- ASTM C260 D. Air entrainment: ASTM C618 E. Fly ash:
- F. Calcium chloride SHALL NOT be used. G. See "Repair Materials & Application For This Project" on this sheet.
- 3. MIX DESIGNS: A. Place only one type of concrete at any given time.
- B. The maximum slump shall be 1" w/o plasticizer added. C. Use pea gravel and/or plasticizer in congested areas. D. Limit fly ash to 20% of the total cement E. Concrete mixes shall conform to the following minimum requirements:
- 28 DAY MAX. MAX. AIR TYPE OF CONCRETE STRENGTH W/C DRY AGGREGATE MEMBER WEIGHT SIZE (ratio) (pcf) (inches) (%) (psi) Slabs on grade: 0.40 150 1.5\* 6 ±1 4000 Suspended slabs: 0.32 150 3/4 Normal Wt. 5000 0.32 150 5000 3/4 Columns: 3 ±1 150 Beams Repair:5000 0.32 3/4 3 ±1
- 5000 0.32 150 3/4 3 ±1 \*Well-graded Aggregates required (1.5"=> course >3/8", medium, and fines <#8) Follow ACI 302 for sand gradation.</pre>
- 4. CONSTRUCTION:
- A. Mechanically vibrate concrete during placement. B. Prior to placing concrete, check with trades to insure proper placement of openings, block outs, sleeves, curbs, conduits, bolts, inserts, embeds, dowels, etc. Place anchor bolts and dowels prior to
- casting concrete, UNO. C. Intentionally roughen contact surfaces (new or existing) at construction joints prior to casting adjacent pours, UNO.
- A. Minimum Interior slabs on grade requirements: 5 inches thickness. Match existing slab.
- A. Place vertical reinforcing in the center of walls UNO.

#### POST-TENSIONING

Construct post-tensioned concrete reinforcing in accordance with ACI 318-05. Replacement anchor's & wedges shall be ICC approved. A copy of the ICC test report shall accompany replacement parts.

2. Post tensioning tendons shall be 0.5" diameter 7 wire strands, unbonded (sheathed), Grade 270, Low Relaxation (26.8k/strand, Fe). Mill certificates for each reel or heat shall be sent to the EOR upon delivery of the tendons to the site. Permissible stresses for tendons shall not exceed those specified by ACI 318-05, Section 18.5.

3. TENDON PROTECTION: Protect tendons from corrosion at all times by an approved coating. The coating shall not become brittle or fluid, but shall be chemically stable, non-active, non-corrosive, and impervious to moisture. Thread replacement strands thru the existing sheathing. Rap exposed strands with a plastic tape. Lap (E) sheathing 4". Strands shall be well greased. Repair all damage to sheathing with plastic tape prior to patch. Exposed strand in the concrete is Not Permitted.

4. The stressing operation shall be under the immediate control of a person experienced in post-tension concrete construction. He must exercise close control of the quality assurance methods and all other operations. The EOR will observe the placement of tendons prior to the placement of concrete, and stressing operations.

5. Jacking forces and elongations records shall be made by the contractor during the stressing operations. Calibrated gauge readings and tendon elongations shall be concurrently recorded. Submit certified copies of the recorded gauge readings and elongations promptly to the EOR. a. Stress tendons by the calibrated gauge readings. Compare the measured tendon elongations with the computed elongations during stressing. Values shall not vary by more than 5%. If any comparisons exceed 5%, the cause for the difference shall be determined by the contractor and corrected to the EOR's satisfaction prior to proceeding with additional stressing.

#### b. Concrete strength at transfer of prestress force to concrete shall be 4,000 psi minimum strength for all post-tensioned members.

## REINFORCING STEEL

- 1. MATERIALS
- A. Reinforcing steel shall be new stock deformed bars and shall conform to ASTM A615, Grade 60, with a design yield strength of 60,000 psi, except as noted below. I. Dowels to be bent in the field during construction shall be
- ASTM A615, Grade 40. II. Reinforcing to be welded shall be ASTM A706, Grade 60,
- "low-alloy steel".
- A. Reinforcing shall be detailed, bolstered, and supported per ACI 315. B. Reinforcing steel shall be free of loose flaky rust, scale, grease, oil, dirt, and other materials which might affect or impair bond. C. Splices in continuous reinforcing shall be made in areas of compression and/or at points of minimum stress, typical UNO. Minimum lap shall be 24 inches long. Dowels shall have a minimum of 30 bar diameters embedment, UNO.
- D. Bends shall be made cold. Do not use heat. Bends shall be done in the fabricator's shop unless specifically noted for the field. Do not un-bend or re-bend a previously bent bar. E. No reinforcing shall be welded unless specifically noted as such. Use E90xx electrodes and ASTM A706 reinforcing. Comply with AWS
- F. All new and existing reinforcement shall have (2) coats of Sika Armatec 110 steel reinforcement primer.

#### CONCRETE REPAIRS SPECIFICATION

#### 1.1 WORK INCLUDED

Furnish all labor, materials, equipment, supervision, and incidentals necessary to locate and remove all delaminated and unsound concrete. Prepare cavities created by said removal to receive patching or overlay materials.

- 1.2 REFERENCES A. "Specifications for Structural Concrete for Buildings," (ACI 301), American Concrete Institute. B. Comply with the provisions of the following codes, specifications,

and standards, except where more stringent requirements are shown on the

#### 1. "Guide for Repair of Concrete Bridge Superstructures" (ACI 546. 1 R), American Concrete Institute.

#### EXECUTION 3.1 WORK AREA

drawings or specified herein:

A. The work area is as noted on the plan sheet S102.

#### 3.02 CONCRETE REMOVAL AND CAVITY PREPARATION

A. Temporary shoring is required at the concrete repair area of the beam, slab and columns. Shores must be in place prior to start of concrete removal and cavity preparation. B. Delaminated, spalled, and unsound concrete areas, vertical and overhead surfaces shall have their boundaries marked and saw-cut, ground or chipped to a depth of 1/2 - 5/8 in. into the existing concrete, measured from the original surface. All edges shall be straight and patch areas square or rectangular shaped. A diamond blade saw or grinder with abrasive disk suitable for cutting concrete is acceptable for performing this work. The edge cut at the delamination boundary shall be dressed perpendicular to the member face. It shall also be of uniform depth, for the entire length of the cut. Extra caution shall be exercised during saw-cutting operations to avoid damaging existing reinforcement (especially pre-stressed tendons) near the surface of concrete. Any damage to existing reinforcement or pre-stressed tendons during removals shall be repaired by the contractor with engineer approved methods.

#### C. All concrete shall be removed from within the marked boundary to a minimum depth of $\frac{\pi}{4}$ in. using 15- to 30-lb chipping hammers equipped with chisel point bits. When directed by the engineer, chipping hammers less than 15 lb shall be used to minimize damage to sound concrete. If delaminations exist beyond the minimum removal depth, then chipping shall continue until all unsound and delaminated concrete has been removed from

- D. Where embedded reinforcement is exposed by concrete removal, extra caution shall be exercised to avoid damaging it during removal of additional unsound concrete. If bond between exposed embedded reinforcement and adjacent concrete is impaired by the contractor's removal operations, then the contractor shall perform additional removal around and beyond the perimeter of the reinforcement for a minimum of 3/4
- in. along the entire length affected. E. If rust is present on embedded reinforcement where it enters sound concrete, then additional removal of concrete along and beneath the reinforcement will be required. Such additional removal shall continue until nonrusted reinforcement is exposed, or removal may be terminated as the engineer directs.

#### 3.03 INSPECTION OF THE CAVITY SURFACES AND EXPOSED REINFORCING

- A. After removals are complete, but prior to final cleaning, the cavity and exposed reinforcement shall be inspected by the contractor and verified by the engineer for compliance with the requirements of Section 3.02. Where the engineer can detect unsatisfactory cavity preparation, the engineer may direct the contractor to perform additional removals. The engineer shall re-verify that the additional removals have been
- performed as directed. B. The contractor shall inspect embedded reinforcement exposed within the cavity for defects due to corrosion or damage resulting from removal operations. Replacement of damaged or defective reinforcement shall be performed according to this section and as directed by the engineer.

#### 3.04 REINFORCEMENT IN REPAIR AREA

A. All embedded reinforcement exposed during surface preparation that has lost more than 10% of the original cross-sectional area due to corrosion shall be considered defective. All non-defective exposed reinforcement that has lost section (to the extent specified above) as a direct result of contractor's removal operations, shall be considered

B. Supplement defective or damaged embedded reinforcement with a reinforcement of equal diameter having a Class "C" minimum splice (ACI 318) beyond the damaged portion of the reinforcement. Secure the new reinforcement to the existing reinforcement with wire ties and/or approved anchors. Supplemental reinforcing bars shall be epoxy coated. ASTM A615 grade 60 steel or coated with (2) coatings of rust inhibitor. Tendon supplement or repair materials shall follow the recommendations of PTI. C. Loose reinforcement exposed during surface preparation shall be securely anchored to the original floor prior to patch placement. Loose reinforcement shall be adequately secured by wire ties to bonded reinforcement or shall have drilled-in anchors installed to the original deck. The engineer shall determine adequacy of wire ties and approve

other anchoring devices prior to their use. D. Concrete shall be removed to provide a minimum of 3/4-in. clearance on all sides of defective or damaged exposed embedded reinforcement that is left in place. A minimum of 1.5 in. concrete cover shall be provided over all new and existing reinforcement. Concrete cover over reinforcement may be reduced to 1 in. if coated with an approved epoxy resin or rust

3.05 CLEANING OF REINFORCING WITHIN DELAMINATION AND SPALL CAVITIES

- A. All exposed steel shall be cleaned of rust to bare metal by sandblasting. B. Paint exposed steel with an approved epoxy resin or rust inhibitor
- and protect from damage prior to and during concrete placement. 3.06 PREPARATION OF CAVITY FOR PATCH PLACEMENT

A. Cavities will be examined prior to commencement of patching

operations. Sounding the surface shall be part of the examination. Any delamination noted during the sounding shall be removed as specified in B. Cavities shall be sandblasted. Airblasting is required as a final step to remove sand. All debris shall be removed from the site prior to

## REPAIR MATERIALS & APPLICATION FOR THIS PROJECT

the start of patching or placement of overlay.

- 1. CODES AND STANDARDS. Comply with the following Codes: A. ACI 301, "Specifications for Structural Concrete for Buildings"
- B. ACI 318, "Building Code Requirements for Reinforced Concrete". 2. MATERIALS & APPLICATION shall conform to the following:
- A. Epoxy Polymer Concrete Overlay: Sikadur Epoxy Broacast Overlay
- Sikadur 21 Lo-Mod LV. 1. Primer Coat: 2. Apply (2) binder coats with broadcasted aggregates applied with both coatings. 3. Binder Coat: Sikadur 22 L0-Mod.
- 4. Broadcast Aggregate: Aggregate per owner approval. 5. Minimum total thickness of applications = 3/16". 6. Cracks > or = 1/8" under overlay area. Rout and seal with Sikaflex-2c NS.
- B. PT Deck Repair: SikaQuick 1000
- C. Reinforced Beam Repair: SikaTop 111 PLUS. D. Reinforcement (steel) Protection: Sika Armatec 110 EpoCem.
- 1. Apply (2) coats 20 mils each. Allow time to dry before second application and before concrete is placed. 2. Properly coat the underside of (E) exposed steel.
- E. Concrete Bonding Agent: Sika Armatec 110 EpoCem.
- patch materials. F. Corrosion Protection (E) Concrete: Sika Galvashield XP+ Anodes.

1. Apply to the surface of (E) concrete interfaces before installing

See General Notes this page

- 1. Install anodes at the perimeter of the repair edges @ 24" O.C. Applies to PT slab, beam and both columns. (32) anodes minimun.
- G. Slip Joint (between PT Deck & Beam): White Cap (Teflon) or 1/2" Neoprene. Pad Determination will be made during construction. H. Joint Material: Sikaflex-2c NS.
- Sika CarboDur Type S1012. I. Bonded FRP System: J. Expansion Joint:

#### "Concrete" for column requirements. 3. CONSTRUCTION & APPLICATION:

- A. Have a copy of Sika "Product Data Sheets" for each repair material and follow all the "How to Use" requirements. This includes surface preparation, preparation work, mixing, application, limitations, cautions, first aid, clean up, etc.
- B. Follow Emseal installation requirements for the expansion joint. C. Substitutions: See "General Instructions To The Contractor & Subcontractors" this sheet Section 8 "Submittals" item C.

## BASIC REPAIR SEQUENCE:

K. Concrete Column:

- 1. Shore structure as needed. Consult with the EOR.
- 2. Remove unsound concrete as needed. DO NOT remove concrete behind post-tension anchors until cables have been detensioned. 3. Expose & clean (E) rebar & PT ancorages and tendons. DO NOT damage
- during repair 4. Inspect (E) rebar & PT ancorages and tendons. Determine if replacement is required. Consult with EOR. Follow his directions. 5. Replace or suppliment (E) rebar & PT ancorages and tendons as
- directed. 6. Prime all esposed rebar & substrate. 7. Install anodes if directed by the EOR.
- 8. Patch concrete.
- 9. Install overlay and Flashing as directed. 10. Install Fiber Reinforced Polymer (RFP) system if required.
- 11. Remove shoring as required for repair.

Sequence and order of repair can be modified according to the contractors expertice and the EOR's requirements to keep the parking structure open.

## BRICK VENEER

- 1. CODES AND STANDARDS: Comply with ACI 530, "Building Code Requirements for Masonry Structures".
- A. Reuse existing brick. Clean old mortar off before reuse.
- Replacement brick shall be the same size, color and texture. Check with EOR if exact match can not be made. B. Type "S" Portland cement-lime mortar. Minimum compressive strength = 1800 psi at 28 days. No additives. Match color of existing mortar.
- At the beginning of the project, the contractor will make (5) different samples of mortars (slight variation in materials) that could match the existing mortar. Closest match as approved by the EOR will be used. Allow (2) weeks for mortars to dry. Keep samples under coverunder cover.
- 3. CONSTRUCTION:
- A. Store brick under cover at the job site. B. Fully bed brick faces.
- C. Tool Mortar joints to match existing. D. DO NOT use any frozen materials.

MASONRY VENEER ANCHOR TIES

C. Mortar color matching:

1. PRODUCT: Use hot-dipped galvanized ties as follows: a. Dovetail anchors

b. DX-10 seismic clip interlock system by Hohmann & Barnard.

- c. EOR approved two-piece adjustable.
- 2. INSTALLATION: A. Provide one tie for every 2 square feet of wall area. B. Maximum tie spacing is 16"o.c. Vert. & Horz. . Provide a continuous horizontal galvanized #9 wire in the center third of mortar joints. Match existing wire locations. Engage or

## STRUCTURAL STEEL

- 1. CODES AND STANDARDS: Comply with:
- A. AISC "Specification for Structural Steel Buildings & Commentary" B. AISC "Code of Standard Practice" 13th Ed. excluding sections 7.5.4, and 7.13.3.

C. AWS "Structural Welding Code", exclude items conflicting with AISC.

2. MATERIALS SHALL CONFORM AS FOLLOWS:

enclose the #9 wire at all anchor ties.

- ASTM A53 Fy = 36 ksi.A. Plates: ASTM A307 or better. B. Bolts: Welded anchors (studs) and deformed bar anchors (DBA's): manufacturer's specifications. DO NOT substitute reinforcing for
- D. Galvanize (G60) all plates, washers, nuts and bolts. 3. CONSTRUCTION:
- A. Fabricate in an approved fabricator's shop.
- A. Use 3/4" diameter bolts in Std. holes (bolt diameter + 1/16"), UNO. B. Use hardened washers beneath the turned element of the bolt or nut. C. Tighten bolts until all plies of the joint are in firm contact.
- Snug tight condition, UNO D. Enlarge bolt holes by reaming. DO NOT torch cut.
- 5. WELDED CONNECTIONS: A. Perform welding and cutting by AWS certified welders in accordance
- with ANSI/AWS D1.1 (latest edition) B. For typical shop & field welds, use filler metals with nominal 70
- ksi tensile strength having: a. Matching material for multiple pass welds. b. A diffusible hydrogen limit of H16 or less.
- c. A CVN toughness of 20 ft-lbs at 0 deg. F. . Use pre-qualified procedures. . Weld intersecting steel shapes together, which are not connected
- with bolts, with all-around fillet welds, UNO. E. Weld studs and DBA's according to Manufacturer's specs. F. Remove slag from welds.

## REPAIR MATERIALS & APPLICATION FOR CONCRETE REPAIR

- 1. CODES AND STANDARDS. Comply with the following Codes: A. ACI 301, "Specifications for Structural Concrete for Buildings".
- B. ACI 318, "Building Code Requirements for Reinforced Concrete". 2. MATERIALS & APPLICATION shall conform to the following
- A. Beam Repair: Ready Mix Concrete (See Concrete General Notes)
- B. Bonding Agent: Sika Armatec 110 EpoCem 1. Apply to the surface of (E) concrete interfaces before
- placement of new concrete or patching materials. C. Bonded FRP System: Sika CarboDur Type S1012

Sonoquard

Sikaflex-2c NS.

- HYDROZO 100 D. Column & Deck Protection: E. Deck Repair: SikaQuick 1000
- F. Elastomeric Coatings: Neogard's Auto-Gard
- Sonneborn's
- G. Epoxy Injection:
- Seal crack & around injection ports Sikadur 31, Hi-Mod Gel Sikadur 35, Hi-Mod LV Pressure-injection
- H. Joint Sealant (Ployurethane):
- I. Reinforcement (steel) Protection: Uncoated Rebar Sika Armatec 110 EpoCem.
  - application and before concrete is placed. 2. Properly coat all sides of exposed steel.
  - Epoxy coated Rebar
  - 3. CONSTRUCTION & APPLICATION: A. Have a copy of the "Product Data Sheets" for each repair material on site and in the hands of the applicator. Follow all product requirements. This includes surface preparation (pressure was or sand blasting), other preparation work, mixing, application, time limitations,

1. Apply (2) coats 20 mils each. Allow time to dry before second

Epoxy

cautions, first aid, clean up, etc. B. Substitutions: See "General Instructions To The Contractor &

Subcontractors this page Section 8 "Submittals" item C.

## BASIC REPAIR SEQUENCE:

## PT Beam Repair: See sheet S5.0 for specfic instructions.

. Expose & clean (E) rebar & PT ancorages and tendons. DO NOT damage

Sequence and order of repair can be modified according to the contractors

expertice and the EOR's requirements to keep the parking structure open.

- Shore structure as needed. Consult with the EOR. 2. Remove unsound concrete. DO NOT remove concrete behind post-tension anchors until cables have been detensioned.
- repar or PT during concrete removal or during repair. 4. Inspect (E) rebar & PT ancorages and tendons. Determine if replacement is required
- Consult with EOR. Follow his directions. 5. Replace or suppliment (E) rebar & PT ancorages and tendons as directed.

6. Prime coat all exposed rebar & substrate.

- 7. Repair all broken PT sheathing. Patch or pour concrete.
- 9. Remove shoring after concrete has acquired sufficient strength.

Expansion Joint Repair: See sheet S6.0 for specfic instructions.

#### WORK REQUIRED & BID ITEMS:

Approximately 125ft<sup>2</sup>/gallon.

The main emphasis of the project is:

Base Bid. Repair the post-tensioned beam that has failed (see Sheet S3.0 for Plan location & Sheet S5.0 for procedure and details.

- Base Bid. Install expansion joints in the guard walls between the parking decks and the northeast stairs. Re-caulk the concrete deck to deck expansion joints at both the north & northeast stairs. All levels above ground level. (see Sheet S3.0, S4.0 for Plan location & Sheet S6.0 for Elevations and details.
- Alternate Bid Items. With the avaliable funds that remain, protective measures are being taken to extend the life of the structure. These
- are in order of importance: 1. Concrete column protection. Apply (2) coating to all (8) interior columns along grid 'PD' with hydrozo 100 penetrating sealer.
- 2. Install concrete curbs between interior guard walls along grid 'PD' from the 2nd level to the 4th level. See Sheets S2.0, S3.0 & S4.0 for curb locations and details.
- 3.Apply elastomeric coatings along interior guard walls and shear walls from the 2nd level to the 4th level. The exterior guard walls are NOT INCLUDED.
- 4.Apply Hydrozo 100 to the surface of all elevated decks from the 2nd lever up. Include the deck to the northeast stairs at the 4th

## BID NUMBERS:

level.

Provide lump sum bid numbers that cover all construction cost to repair the post-tensioned beam, expansion joint repairs @ the stairs, and for

Provide both lump sum and cost per linear foot or square foot for both the concrete curb, elastomeric edge coating and cleaning & deck

- Bid numbers should include the cost required to complete all work and repairs such as:
- Mobilization . Materials

the column protection.

- Labor 4. Shoring
- 5. Forming
- . Welding . Specialty equipment & hardware
- 8. Clean-up 9. Repair of damaged property such as lawn, flower beds, sprinkler system, parking garage structure and/or adjacent property intensionaly or accidentally damaged during the construction and
- repair process. 10. Any other items required to complete the project.

#### PRIME CONSLUTANT & WCA STRUCTURAL ENGINEERING

The contractor is required to walk the project before submitting his bid

The owner (DFCM) is the prime consultant. However, no draws or payments will be made to the contractor without the approval of WCA. WCA has provided these drawings and the scope of work to be accomplished.

A close relationship will be required between the contractor and WCA.

The contractor will be required to performe to WCA's expectations as

General methods to complete the work have also been included.

be provided to all parties prior to the bid date.

inicated by these drawings. Any discrepancys, errors or omissions in these drawings, noted by the contractor during the biding process, shall be brought to the attenion of WCA and resolved before the final bid. Addendum items, as required, will



Engineering a

442 North Main Street, Suite 200

Bountiful, Utah 84010

e-mail: cliff.cole@wcaeng.com

(801) 298-1118, Office 298-1122 Fax



WILLMORE

CONSULTANTS

**DEPARTMENT OF WORKFORCE SERVICES** 

PARKING GARAGE

|DFCM PROJECT#

DEPARTMENT OF **WORKFORCE SERVICES** 

PARKING GARAGE **720 SOUTH 200 EAST** SALT LAKE CITY, UT

\* DATE DESC.

JULY 200 ISSUE:

Ø7Ø37

NT

KW

PROJECT NO:

DRAWN BY:

SHEET INDEX

S1.0 GENERAL STRUCTUARL NOTES

S2.0 LEVEL 1 & 2 PARKING GARAGE

\$3.0 LEVELS 2 & 3 PARKING GARAGE

S5.0 | BEAM SECTION & ENLARGED ELEVATION

S4.0 LEVEL 4 PARKING GARAGE

S6.0 | ELEVATIONS

SHEET TITLE

SHEET NO.

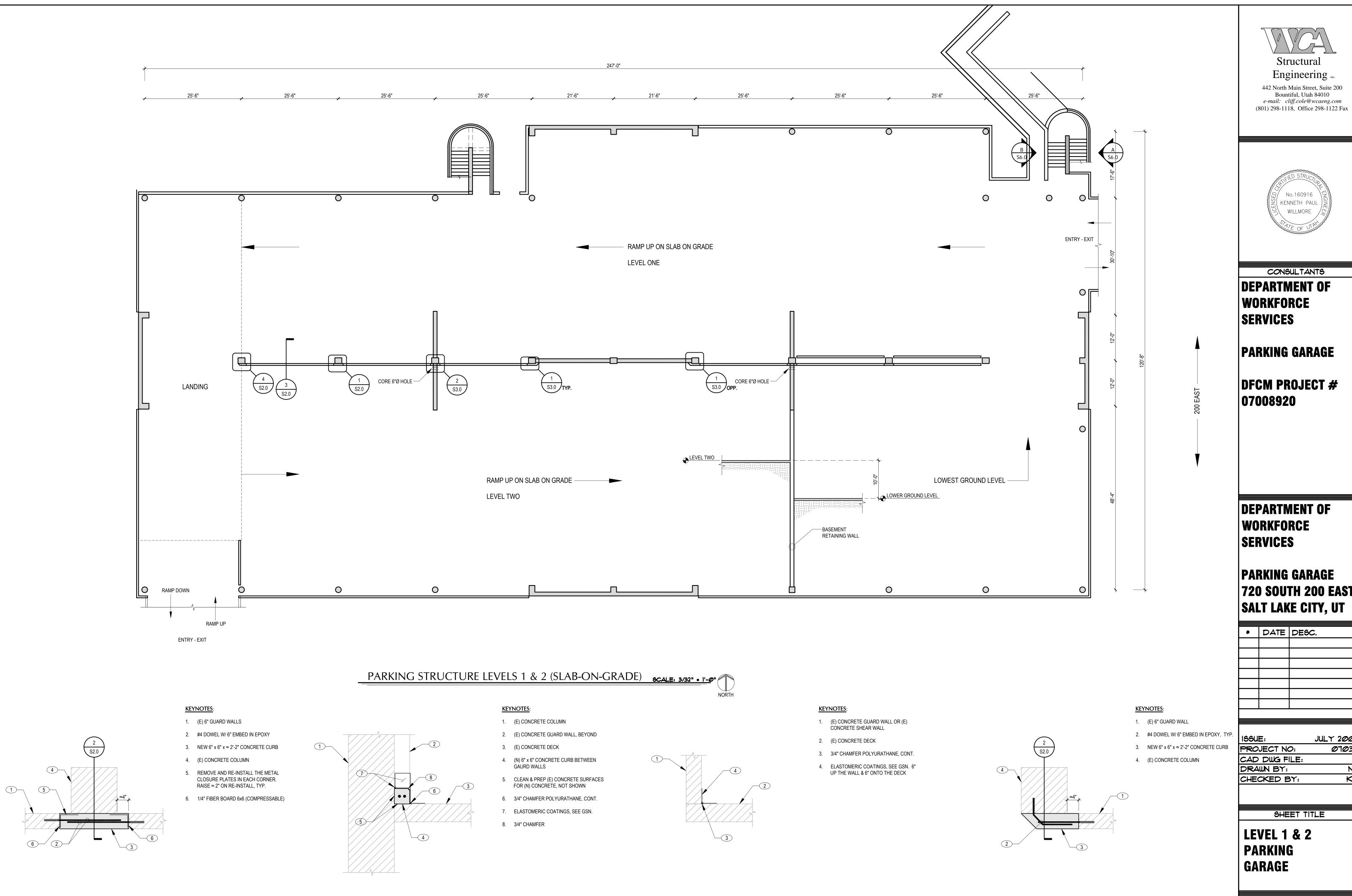
CAD DWG FILE:

CHECKED BY:

SHEET TITLE

**GENERAL STRUCTURAL NOTES (GSN)** 

**S1.0** 



3 DETAIL (ALTERNATE BID)
S2.0 NO SCALE

PLAN VIEW OF (N) CONCRETE CURB, TYPICAL (ALTERNATE BID)

S2.0 NO SCALE

2 CONCRETE CURB DETAIL, TYPICAL (ALTERNATE BID)
S2.0 NO SCALE

Structural Engineering in



**DEPARTMENT OF** WORKFORCE

**PARKING GARAGE** 

DFCM PROJECT # 07008920

**DEPARTMENT OF** WORKFORCE SERVICES

**PARKING GARAGE 720 SOUTH 200 EAST** SALT LAKE CITY, UT

| * | DATE | DESC. |
|---|------|-------|
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |

| ISSUE:        | JULY 2007     |
|---------------|---------------|
| PROJECT NO:   | Ø7Ø3 <b>7</b> |
| CAD DWG FILE: |               |
| DRAWN BY:     | NT            |
| CHECKED BY:   | KW            |
|               |               |

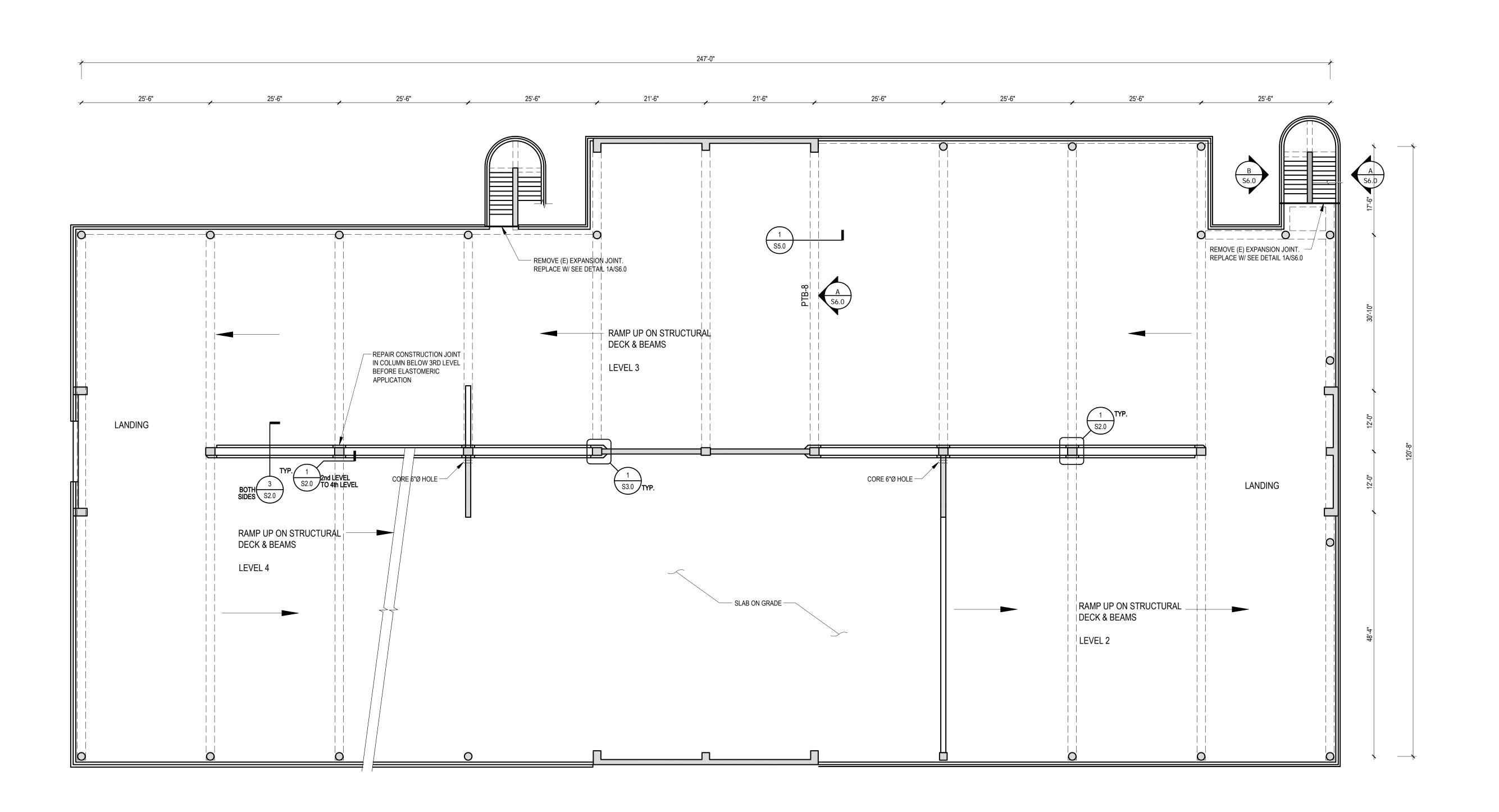
SHEET TITLE

**LEVEL 1 & 2 PARKING** GARAGE

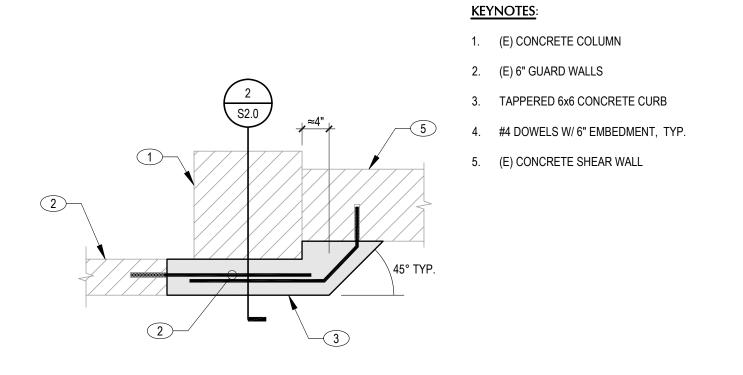
PLAN @ DECK EDGE & END COLUMN (ALTERNATE BID)

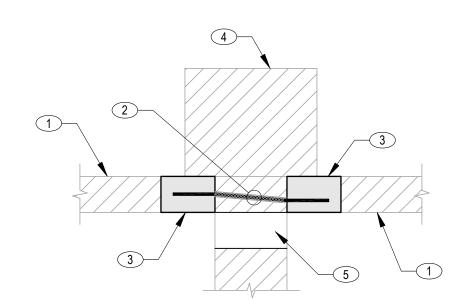
NO SCALE

**S2.0** 



# PARKING STRUCTURE LEVELS 2, 3 & 4 (ELEVATED STRUCRURAL DECK & BEAMS) \*\*CALE: 3/32" \* 1'-@" NORTH





## KEYNOTES:

- 1. (E) 6" GUARD WALLS
- #4 DOWEL DRILL THRU CONCRETE SHEAR WALL. SEE DETAIL 2/S2.0, SIMILAR
- 3. NEW 6" x 6" x ≈ 9" CONCRETE CURB
- NEW 6" x 6" x ≈ 9" CONCRETE CURB
- 4. (E) CONCRETE COLUMN
- 5. (N) 6"Ø CORED HOLE. BOTTOM EDGE FLUSH W/ TOP OF PARKING DECK. COAT INSIDE OF HOLES W/ ELASTOMERIC COATING.

CAD DWG FILE:
DRAWN BY:
CHECKED BY:
SHEET TITLE

JULY 2007

Ø7Ø3**7** 

Structural

Engineering inc.

442 North Main Street, Suite 200 Bountiful, Utah 84010 e-mail: cliff.cole@wcaeng.com (801) 298-1118, Office 298-1122 Fax

KENNETH PAUL

WILLMORE

CONSULTANTS

**DEPARTMENT OF** 

**PARKING GARAGE** 

DFCM PROJECT #

**DEPARTMENT OF** 

**PARKING GARAGE** 

**720 SOUTH 200 EAST** 

SALT LAKE CITY, UT

\* DATE DESC.

WORKFORCE

SERVICES

WORKFORCE

SERVICES

07008920

LEVELS 2 & 3
PARKING
GARAGE

ISSUE:

PROJECT NO:

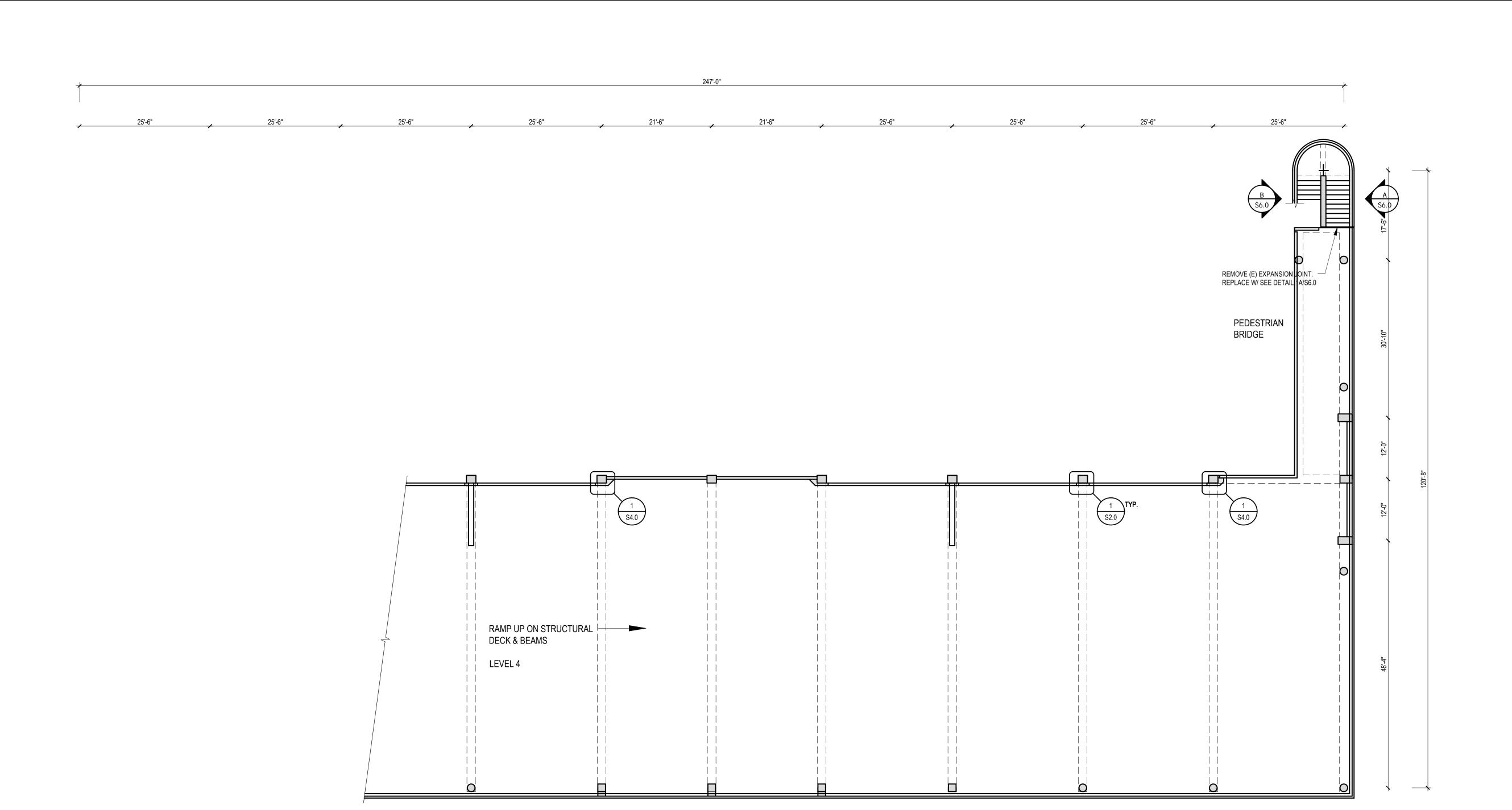
**S3.0** 

DETAIL (ALTERNATE BID)

NO SCALE

DETAIL (ALTERNATE BID)

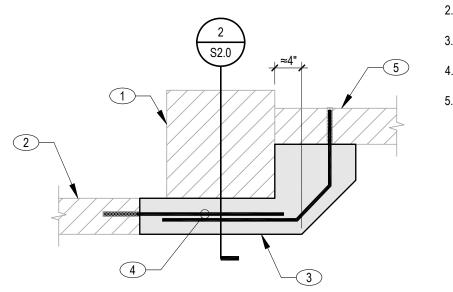
S3.0 NO SCALE



## PARKING STRUCTURE LEVEL 4 & PEDESTRIAN BRIDGE SCALE: 3/32" = 1'-0"

## KEYNOTES:

- 1. (E) CONCRETE COLUMN
- 2. (E) 6" GUARD WALLS
- 3. TAPPERED 6x6 CONCRETE CURB
- 4. #4 DOWELS W/ 6" EMBEDMENT, TYP.5. (E) CONCRETE GAURD WALL

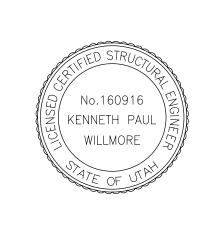


## NOTES:

REMOVE (E) EXPANSION JOINT. REPLACE
 W/ ..... SEE DETAIL 1A/S6.0



442 North Main Street, Suite 200
Bountiful, Utah 84010
e-mail: cliff.cole@wcaeng.com
(801) 298-1118, Office 298-1122 Fax



CONSULTANTS

DEPARTMENT OF WORKFORCE SERVICES

**PARKING GARAGE** 

DFCM PROJECT # 07008920

DEPARTMENT OF WORKFORCE SERVICES

PARKING GARAGE 720 SOUTH 200 EAST SALT LAKE CITY, UT

| * | DATE | DESC. |
|---|------|-------|
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
| · |      |       |
|   |      |       |

| ISSUE:        | JULY 2007     |
|---------------|---------------|
| PROJECT NO:   | Ø7Ø3 <b>7</b> |
| CAD DWG FILE: |               |
| DRAWN BY:     | ΝŤ            |
| CHECKED BY:   | KW            |
|               |               |

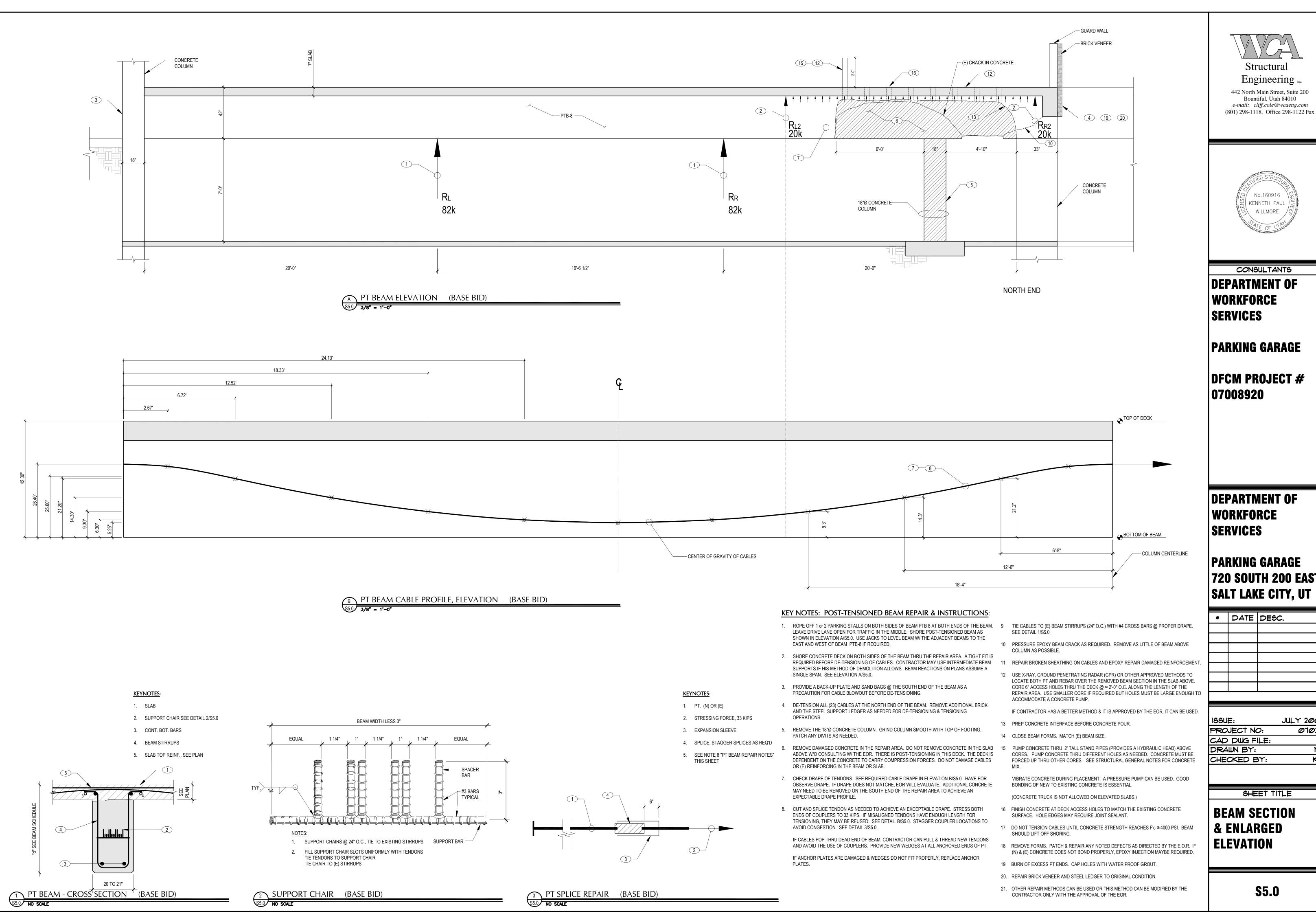
SHEET TITLE

LEVEL 4
PARKING
GARAGE

**S4.0** 

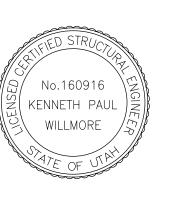
DETAIL (ALTERNATE BID)

S4.0 NO SCALE





442 North Main Street, Suite 200 Bountiful, Utah 84010 e-mail: cliff.cole@wcaeng.com

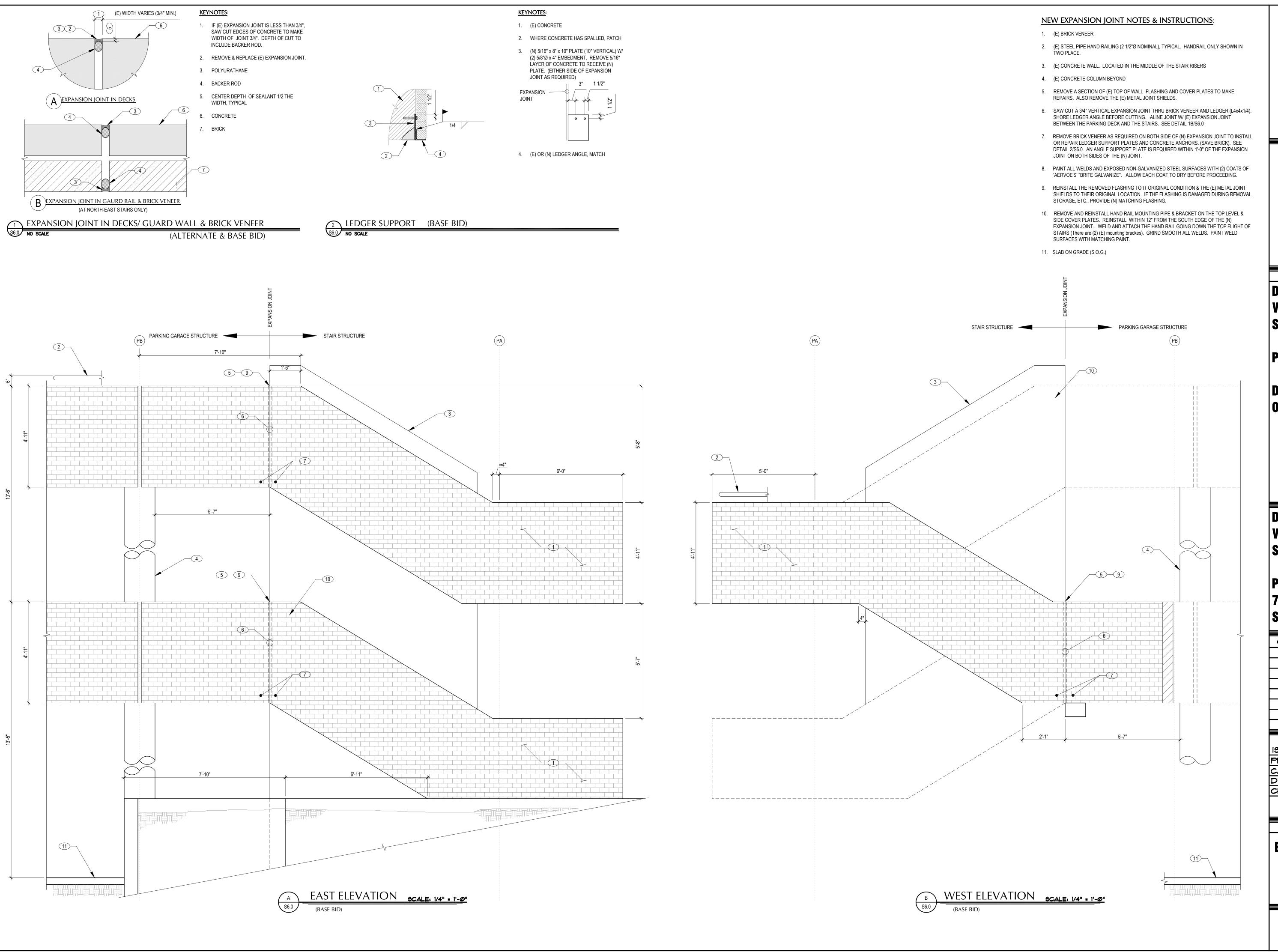


**DEPARTMENT OF** 

**PARKING GARAGE 720 SOUTH 200 EAST** 

| ISSUE:      | JULY 2007 |
|-------------|-----------|
| PROJECT NO: | Ø7Ø37     |

| 10042.        | OUL I ZEE I |
|---------------|-------------|
| PROJECT NO:   | Ø7Ø37       |
| CAD DWG FILE: |             |
| DRAWN BY:     | NT          |
| CHECKED BY:   | KW          |
|               |             |

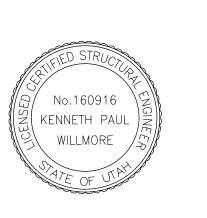




Structural Engineering in

442 North Main Street, Suite 200
Bountiful, Utah 84010
e-mail: cliff.cole@wcaeng.com

(801) 298-1118, Office 298-1122 Fax



CONSULTANTS
DEPARTMENT OF

WORKFORCE SERVICES

PARKING GARAGE

DFCM PROJECT # 07008920

DEPARTMENT OF WORKFORCE SERVICES

PARKING GARAGE 720 SOUTH 200 EAST SALT LAKE CITY, UT

| * | DATE | DESC. |
|---|------|-------|
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |
|   |      |       |

| ISSUE:        | JULY 2007     |
|---------------|---------------|
| PROJECT NO:   | Ø7Ø3 <b>7</b> |
| CAD DWG FILE: |               |
| DRAWN BY:     | NT            |
| CHECKED BY:   | KW            |
|               |               |

SHEET TITLE

**ELEVATIONS** 

**S6.0**